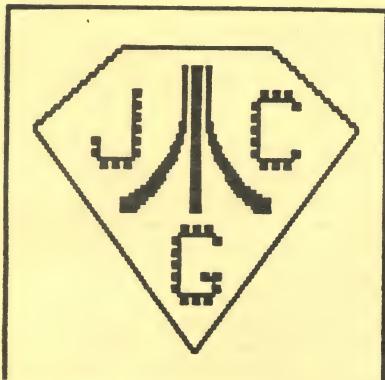


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JACG VOICE

NEWSLETTER

Vol. 3 No. 1

Sept. 1983

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THE JERSEY ATARI COMPUTER GROUP

From the Editor's Desk

Welcome to another issue of the Jersey Atari Computer Group Newsletter that I am extremely proud of. This is the first issue of volume 3. The beginning of my second year as Editor. Boy, have things changed over the last year for me, this Newsletter and for the Atari community.

I have learned a tremendous amount about computing in the last year. I have also learned much about publishing a Newsletter. With all humility aside, I think that the JACG Newsletter is the best in the country. This is not my doing alone. The members of JACG, with their contributions, input and support, have helped to create a fine publication that is respected by other user groups, individuals and the general Atari community.

What has changed about the Newsletter itself? You will notice immediately the color. Ocean Green. A distinctive and attractive color. The regular columnists. Dick Kushner's BASIC column debuts in this issue. Dick has done a great job in simultaneously providing information for both the beginner and intermediate BASIC programmer. Also debuting in this issue is Frank Pazel's educational column, called the Report Card. Frank will be reviewing educational software and discussing relevant educational issues in future columns. We also now have a FORTH column by Donald Forbes. Don is really into FORTH and will be a regular monthly columnist. Last, but not least, is my own column called Art's Arcade. The latest in game software will be reviewed in depth, in each future issue.

The Atari community in general. With prices being slashed on 400s and 800s, more and more people are becoming involved in computing. The new machines have not yet appeared but everyone is eagerly awaiting the big turn-around that Atari seems to be in the process of doing. There has been a flood of good software for the Atari computer, some of which is actually coming from Atari itself. Microsoft BASIC II, Atariwriter, Paint and LOGO are some of the outstanding new Atari products.

There are some new software houses, like Electronic Arts, that have shown that they are serious about producing software that takes the Atari to its limits.

The JACG has perfect timing. We have run out of money exactly at the end of the year. In fact, this issue is slightly smaller than usual due to the low funds. Therefore, it is time for all of you to renew your membership. The dues are now \$20.00 to cover the cost of first class mailing of the Newsletters after being distributed at the meetings. The increase will also ensure that the quality of the Newsletter does not decline. If you expect to see an October issue, you had better renew right now. See the application form elsewhere in this issue.

Finally, the October JACG Newsletter will be the long-awaited, much publicized, ALL PROGRAMMING issue. This will be a real blow out of an issue and will probably be the best Newsletter yet.

Arthur Leyenberger
Editor in Chief, JACG Newsletter ▲

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AND NOW A WORD FROM THE PRESIDENT....

The strike against the Bell System has certainly thrown a monkey wrench into our smooth JACG operation. We are unable to use the auditorium at Bell Labs until the strike is over. By the time you get this you will know if we were able to find a suitable alternative meeting place for September (assuming the strike is still on). If we do not find a place, there will be no meetings until the strike is over. We'll just keep pushing everything back in time - with one exception. DUES ARE DUE NOW! We planned everything so carefully last year that we came to the end of our year (August) with virtually no money in the treasury (as it should be with a non-profit group). This means that we must rely on the new dues to pay the expenses. As you all know, the major expense (and one of the major sources of our pride) is this newsletter. If we are to continue to produce such a high quality newsletter and provide our other services, we need to collect the dues to pay for the printing and distribution of newsletters, the Bulletin Board expenses and trips to Europe for your president. (Scratch that last item.) So take this opportunity to fill out a check and mail in your \$20 dues for the September 1983 to September 1984 JACG year to our treasurer Rick Olson, 5 Starling Dr., Randolph, NJ 07869. What! \$20 you say! Yes, the dues were raised to \$20 in order to provide for mailing the newsletters first class (after distribution to those who come to meetings).

Just when it seemed that Atari was settling down and getting its act together (as witnessed by the products shown at the C.E.S.) we get new, scary rumors. There's a whole lot of executive shaking going on at Atari in Sunnyvale. It seems that even a request for a transfer is greeted with being shown the door. We hope that James Morgan, the new Atari head (stolen from Philip Morris) finds a company there when he takes over. Atari got too big too fast and management is looking for scapegoats for its current fall. Come on Atari, just get out there in the market place and show your wares. I still don't regret having gotten the Atari 800 - it's one fine computer. Therefore, I will not pass along any of the gloomy rumors. Why should I spoil your day?

We're still entertaining nominations for officers. We'll close the nominations as soon as we have a meeting and hold elections at the next meeting after that. Information as to meeting cancellations can be gotten from the Bulletin Board or by calling any of the officers (at reasonable hours, please.)

Richard Kushner
JACG President



JACG MEMBERSHIP

The Jersey Atari Computer Group (JACG) invites you to become a member. Dues are \$20.00 per year and entitle the member to 1) Receive the monthly newsletter; 2) Purchase programs from the group's extensive tape and disk librarys at special rates; 3) Join special interest groups or form new ones; 4) Benefit from the expertise and experience of other Atari computer users; 5) Participate in group purchases of software at substantially reduced prices; 6) Receive a membership card that entitles the member to discounts at local computer stores; 7) Attend monthly meetings to learn about the latest hardware and software, rumors, and techniques for getting the most out of your Atari computer; 8) Submit articles and programs to the newsletter and give demos and presentations at the monthly meetings; 9) Participate in sale/swap activities with other members; and 10) Have a lot of fun.

If all of this sounds good then send a check or money order, payable to JACG, to:

Rick Olson
5 Starling Drive
Randolph, NJ 07869

Remember, receiving the JACG Newsletter is just one of the many benefits of being a member of JACG.

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THE REPORT CARD

By Frank Pazel - JACG

Let's be honest. It is the easiest thing in the world to criticize someone else's software and most difficult to objectively look at our own creation. The purpose of this continuing column is to look at the general quality of educational software and, when necessary, to criticize it for lack of common sense or courtesy. My views will necessarily be prejudiced by my subjective feelings about what makes software good or bad, but I will always tell you why I made a particular judgement.

This month's program is "Spelling Bee Games", produced by Dragonware, a division of Edu-Ware Services, Inc. They are the makers of Compu-Read and Compu-Math. Spelling Bee Games presents "word play for children ages 5-10" using joysticks in various ways to identify pictures with their spelled names. It has 4 animated games which allow two (sometimes more) competitors to fly a helicopter, pilot an airplane, move an 18-wheeler, or play a form of concentration. Wordlists can be selected from three-letters to multi-syllable words. Scores are constantly displayed, encouraging competition.

Most of us like to load in a new program with hardly a glance at the documentation. In our haste to see the pretties we sometimes stub our mental toes. This is definitely the case in Spelling Bee Games. The booklet which explains the program's use is complete and well done. You will be able to use the program with a modicum of success but unless you read the documentation, you won't know where to find certain features that seem to have been left out.

The program contains a hidden "Configuration Module" containing 22 units. You access it by pressing the right arrow key whenever the program first loads. This portion of the program is intentionally not visible to the players so that the parent or teacher can set up specific parameters for the youngster. The units range from simple two and three letter words to one syllable with diphthongs (look that one up) to directions and numbers to shapes, animals, and assorted words. In other words, you can select the types of words which are most appropriate for the players. In educationalese: you write a specific reading prescription. Very good.

The main menu contains Squadron, Skyhook, Puzzle, and Convoy. Squadron has two players fly their airplanes to come in contact with words describing the picture on their side of the screen. Good sounds, kids like it. Skyhook can have up to four players maneuvering a helicopter to pick up letters which will eventually spell the word associated with the picture on the screen. We hear words like motor-skill and eye-hand coordination with this one. Up to four drivers can move their

tractor-trailers in Convoy in a race to, again, correctly spell words related to a picture. Slow, but younger kids will probably love it.

I personally liked Puzzle best of all. It contained elements that I think constitute good learning and good programming. It is a simple version of the old concentration principle using those words you have configured from the 22 optional levels. A picture appears in each of the large six squares. The players have six seconds to study the pictures while the internal speaker of the computer ticks off the time. All the pictures disappear behind doors numbered one to six. A word appears and the first player must type in the number of the door covering that picture. After a RETURN the door opens. If correct the door remains open and score a point. If incorrect the door closes and the next player gets a new word and picture to locate. When five pictures have been correctly identified the screen clears and a new set of pictures is shown.

Problems? Some. For openers, the instructions were originally written for the (ugh) Apple and notes for Atari users are sprinkled throughout almost like an afterthought. The frustration comes right after you've opened the box and are anxious to properly use the software. You read how to do something only to discover that now you have to modify it in your mindset to work on the Atari. A small irritation which could have been avoided with separate printings or separate sections in the same booklet. Some instructions, incidentally, do not apply to the Atari.

The program uses two disks. If you have two drives it is easy. After the logo, title page, and main menu have done their job (up to 1-1/4 minutes) you then must switch to the picture disk. Not a good chore for little hands normally so an adult user must get the little ones totally on board. Speaking of waiting time- it takes about 25 seconds to get some new picture screens. This isn't terrible but some people may find this feature distracting.

Okay, report card time. Overall I give this program a B+. If you look at your kid's report card you might see that a B is above average. A program will have to be super to get an A in my class, but Spelling Bee Games got pretty close. If you have a youngster in the 5-10 year old range who could benefit from drill and practice in various combinations of words while having some fun at the same time this program should be high on your "let's see" list. It lists for \$39.95 and is available from Edu-Ware Services, Inc., P.O. Box 22222, Agoura, CA 91301.

▲



Technical Corner
By Ernie Rice - JACG

Welcome to the Technical Corner of the JACG Newsletter. This month's article will provide an explanation of how a programmer would go about running an assembler program from a BASIC program. This feature allows you many powerful capabilities and should not be ignored.

Most ATARI owners are familiar with the power of the BASIC language. BASIC is simple to learn and provides many very helpful debugging aids. This is all well and good, but ATARI BASIC is slow and not appropriate for all tasks. Consider the requirements for an Arcade style game where fast action is mandatory. BASIC could not be considered as a viable language for this time-critical code. Another example is in direct accessing of specific sectors on a diskette. ATARI's BASIC has the POINT and NOTE functions to determine the current sector being read, or to position to a specific sector on a diskette. The limitation with NOTE and POINT is that these only allow access to those sectors contained within a file. What about direct READ of the Disk Directory or direct reading of the VTOC? Forget it under BASIC- Assembler is required to perform these functions.

Future articles will provide the readers with with BASIC program using very short assembler routines that will prove invaluable to the ATARI programmer. In order for the users to be able to expand on these programs, it is important for them to understand exactly what is being done so that modification will be simple and trouble free. It is in this light that I present this month's article.

ATARI BASIC provides the user with a function known as the USR function. This allows the programmer to run an assembler program already in core (the computer's main memory). Information may be passed to the assembler code, as well as returned from the assembler routine.

Passing information to the assembler routine is valuable when you wish to use the same program to perform different tasks depending on the value supplied. The return value of the other hand may be used to determine the success or failure of the execution of the assembler program.

As an example, I may write an assembler program to read any sector on disk. This assembler routine will be passed the number of the sector I wish to read and return a value indicating whether or not the READ was successful. Note that without this assembler program, the user would have no way of reading any sector he or she desires.

The format of the USR function is:

Numeric Variable=USR(Address, Value1, Value2...ValueN)

Where the Numeric Variable is the name of a numeric variable that contains the return code from the assembler routine which starts at address (or location) 'Address' in the computer's memory. Value1, Value2... ValueN are N different values to be supplied to the assembler routine as Input. These must all be positive Integer values. Numbers such as -3, 1.25 are invalid.

So if I code the following USR statement in a BASIC program

X=USR(1536,1,2,3)

The result would be to cause BASIC to branch to the assembler code located as address 1536(decimal), and make available as input the values 1,2,3. The return code from the assembler routine will be available to the BASIC program via the variable X.

Note that even though these input and output variables are available, it is still up to the programmer to READ the input variables in the assembler routine and also to store the value in the assembler routine and store the value in the proper locations for the return code. The assembler or BASIC will not do this on its own.

The locations for the return code are D4, D5 (Hexidecimal) or 212, 213 (decimal). Therefore in order for the BASIC program to receive the proper value for the return code, it must be stored in these locations just prior to exiting the assembler routine. The input values are placed on the system's stack. Stacks will be discussed in a later article.

Why do you need 2 locations for the return code? Well - the ATARI is driven by a 6502B processor. This is an 8 bit processor. Each byte is comprised of 8 bits, with each bit representing a power of 2. Therefore the maximum value able to be stored in one byte is 2 raised to the 8th power minus 1.

Format of an 8 bit processor

7	6	5	4	3	2	1	0	:	Power of
2 bit number									
:	:	:	:	:	:	:	:	1	
128	64	32	16	8	4	2	1		
Resulting value									

Each bit can be in one of two states: ON or OFF (just like a light switch). Numbers stored in this format are called

Continued on Page 16



ART'S ARCADE
by Arthur Leyenberger - JACG

Copyright (c) 1983 Arthur Leyenberger



Welcome to the first edition of Art's Arcade. This column will bring you reviews of all of the latest game software for the Atari computer. Each month I will focus on 2-4 games that I think are worthwhile and discuss them in depth. This month I have four excellent games to talk about. All four are different. There is a twitch game, a climbing game, a space shoot-'em-up and a unique game that is very addicting. With a lot to talk about, let's get going.

Kaboom!

Like many Atari computer owners, I began my gaming/computing "career" with an Atari VCS. This was about the time that after-market companies began producing video games for the 10 million or so existing units. One of the first of these entrepreneurial ventures was a company called Activision. Their hallmark was producing VCS games that stretched the hardware to its limits, and in some cases, beyond. Graphics were usually better than anything seen before. They continue to be a leader in this area and have now begun to convert some of the more popular titles to the Atari 400/800.

When I first played Kaboom!, back in those halcyon days of electronic gaming, I was impressed by its graphics. Moreover, I was amazed that a game with such a simple theme could be so engrossing. A cartoon convict, called the Mad Bomber, dropped an endless supply of bombs with lighted, crackling fuses from the top of the screen. My task was to catch these bombs in one of my three water buckets. If a single bomb was missed, the remaining on-screen bombs would explode and I would lose one of my buckets. The object of the game is to score as many points as possible by catching bombs dropped by the Mad Bomber.

The first level contains 10 bombs. After that, the count increases by 10 each level until level 6 is reached where there are 75 bombs. Level 7 has 100 bombs and level 8, the highest, has 150 bombs. Point values for each bomb caught are equal to the level number. The rate at which the Bomber drops the bombs steadily increases to the hectic pace of 13 bombs per second by level 8. That's 13 per second Obiwan, so the Force had better be with you. As each bomb is caught, the 1812 overture is played. This musical feature is just one of the several enhancements the game received during its translation to the computer.

There are three game variations. One player vs. the Mad Bomber, two players taking turns against the Bomber and a Pitch and Catch game where the two players

alternate roles of playing the Bomber (dropping the bombs) and playing the buckets (catching the bombs). There are several control modes and the control action is quite good. These modes are the result of choosing either large or small buckets and either paddle or joystick controllers. Your selection is displayed at the top of the screen with a little symbol of a large or small joystick or paddle.

Kaboom! for the Atari computer is just as much fun as the VCS version and the additional features make it more enjoyable. It was initially designed by Larry Kaplan and adapted for the computer by Paul Willson. Fellas, good job.

Kaboom! requires 16K and sells for \$39.95.

Jumpman Junior

There are several climbing games for the Atari computer. One of the most popular is Miner 2049er by Big Five Software. Many of the other games are look-alikes that don't really add anything to this type of game. Jumpman Junior, from Epyx, is different. It is a climbing game that has enough challenge, features and variation to satisfy anyone wishing to play a non-clone climbing game. Let's take a closer look at this fun game from Epyx.

The situation is grim. The Jupiter Command Substation is being attacked by the Alienators who are bent on destroying this valuable outpost. Jumpman, Jupiter's super secret agent, is busy trying to restore communications at the Command Station. He is too busy to find and diffuse the bombs that have been placed throughout the twelve levels of the Station. That's where you, Jumpman Junior, come in.

Your task is to move up and down the ladders, ropes and elevators to reach and disarm the bombs. Your only weapons are your speed and agility... and your jet boosters that let you leap away from bullets, electrocution traps and moving walls.

Up to four players can compete, with each player taking a turn at the one joystick control. At the beginning of the game, the Jumpman's speed is selected which is a choice that will last for the remainder of the game. Each player gets four lives.

You would expect the jumping movement to be short and precise given the increased gravity of the planet Jupiter. The movement is actually quite the contrary. The jumps are slow and Jman Jr. appears to drift in the direction that he is headed. It is really quite a nice effect. In addition to the ladders that appear throughout the 12 screens, there are one-way ropes. Some can only be

climbed up while others can only be climbed down.

Jumpman Junior was designed and programmed by Randy Glover. In addition to giving us a very playable and enjoyable game, Randy included a pre-game show. That's right, when the title screen is first displayed, a group of Jumpmen perform a little dance to the sound of a cute tune. This is just one of the many nice touches to this game.

Jumpman Junior sells for \$39.95 and requires 16K.

Astro Chase by Parker Brothers

"There is no Escape" proclaimed the packaging and advertisements for Astro Chase when it was first released by First Star Software. Once again, there is no escape, but this time it is from Parker Brothers who have bought the rights to the game and are marketing it as a cartridge. This is one of the first of their games for the Atari computer. Others will follow shortly: Q-Bert, Risk, Popeye and several others.

If you have been asleep for the last year, read on for I will briefly describe the game for you. Otherwise, you can skip this section because the latest version of Astro Chase is exactly the same as the original great release.

The scene opens with an astronaut goose-stepping his way from stage right to a space pad, saluting you and beaming up to a waiting saucer. The saucer blasts off and the scene changes to an excellent space-eye view of the earth and other heavenly bodies. You control the saucer in a desperate attempt to (what else?) save the earth.

You must locate and destroy the mega-mines that are slowly (at first) advancing towards the earth. A single mine, if allowed to reach the earth, can spell the end of civilization as we know it. There are alien ships that make your life more difficult. Vertical and horizontal scrolling is the name of the game and the control of your ship is quite good.

One of the unique features of the game is the intermissions that occur after every four screens. After the fourth screen, the astronaut lands and looks around, scratching his head as if to say, "Where is everybody?" Crowds appear to cheer him after the eighth screen and after the twelfth screen, the crowds appear, a limo pulls up and the astronaut is whisked away with a relief astronaut taking his place.

All things considered, Astro Chase has become a classic. The graphics and animation alone, have set new standards for Atari computer games to come.

Astro Chase sells for \$39.95 and requires 16K.

Archon by Electronic Arts

What do you get when you cross chess, dungeons and dragons and combat? Give up? You get, to use the famous Monty Python words, something completely different. Archon.

The game combines the strategy of a board game with the excitement and action of an arcade game. It depicts the classic struggle between light and darkness, good and evil. The battle between the opposing forces is drawn from myth and legend and begins as an electronic board game. The strength and number of the Light Side and the Dark Side are equal. However, the players and their individual powers are not identical.

There are 18 icons per side made up of eight different players. Each "piece" can move in a particular manner which is displayed at the bottom of the screen as the piece is moved. On the first screen, the board screen, a 9 by 9 grid is composed of black, white and luminosity squares. The black and white squares maintain their color throughout the game while the luminosity squares vary in brightness during the game.

The luminosity cycle continues throughout the game, back and forth from dark to light, shifting gradually after every other turn. The lighter the square, the more power the light icons have doing battle on that square and vice versa for the dark pieces.

Did I say battle? Yes. Unlike chess where mere possession of a square grants ownership, landing on an occupied square in Archon requires that the two icons battle it out for ownership. The battle is a real-time fight under joystick control, displayed on the second screen, the battlefield. Good coordination, a quick wit and a thorough understanding of the various weapons that each piece possess is mandatory for success on the battlefield. It is just about suicide to challenge an opponent on his own colored square.

In addition to the luminosity squares, there are 5 Power Points. Their position is indicated on the board screen by flashing dots. Capturing all 5 power points wins you the game as does eliminating all of your opponent's pieces. Icons on Power Points heal faster than usual and are protected from the effects of magic spells.

Archon is primarily a two player game. You can challenge the computer but you would probably be more successful trying to kick start a 747. The best way to learn the game is to watch the computer play itself. This will occur within two

Continued on Next Page

minutes after the game is loaded. With the excellent manual in hand, watch the strategy and action take place on the screen and follow along. The game can be paused at any time by pressing the space bar in order to give you a chance to see who is fighting who and what their specific powers might be.

Archon is a great game, a classic. Like all of Electronic Arts' games, it requires the player to be totally involved with the game. Electronic Arts views the computer as a new creative medium. They refer to their program authors as artists and their product managers are viewed as producers.

Jon Freeman, Anne Westfall and Paul Reiche III are the artists responsible for Archon. The packaging is akin to a record album, complete with liner notes and artist biography. The manual is also excellent. It contains the rules, strategy, tips and even questions and answers. Archon is one fine game and Electronic Arts is a company we will be hearing more from.

Archon requires 48K and sells for \$39.95. Buy it!



1983-84 JACG Membership

Membership in the Jersey Atari Computer Group runs from September to August. The dues for the 1983-84 year are \$20.00 and are now due. Your check or money order should be mailed to Rick Olson, JACG Treasurer, 5 Starling Drive, Randolph, NJ 07869. Please use the form below or copy the information on a separate piece of paper. Be sure to include your name (as it appears on the JACG official mailing label) and indicate any changes to your name or address. If you are just joining, please indicate that you are a new member.

JACG 1983-84 Membership Application

Name _____

Address _____

City _____

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I am a new Member _____ (yes)

From the Big Cheese -

Chairman of the Board
Chief Executive Officer

Atari Incorporated
1265 Borregas Avenue
PO Box 427
Sunnyvale California 94086
408 745 2730

August 5, 1983

Mr. L. Arthur Leyenberger
Editor
Jersey Atari Computer Group Newsletter
40 Lawrence Road
Parsippany, New Jersey 07054

Dear Mr. Leyenberger:

Thank you very much for your thoughtful letter regarding Atari. First let me say that I will be unable to attend your August 13 meeting; however, if I can fit into what is an unbelievably hectic schedule a future meeting of JACG, I will certainly give you a call or drop you a note in advance.

It is essential that Atari as a consumer electronics company remember the consumer and electronics parts equally. As a marketer, I find fault with the entire home computer industry in that it seems historically to have concentrated on providing what it could make without giving sufficient attention to what the consumer wants. I hope to remedy that situation and the continuing input of groups such as JACG is essential.

Thank you again.

Sincerely,
[Handwritten signature]
James J. Morgan

JJM/mm

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YOU MAKE IT UP AS YOU GO ALONG

by Donald Forbes - JACG

That's Forth. You make it up as you go along. I once met a scholarly young abstract painter who exhibited his brightly colored formless canvasses all labelled with striking titles that bore no discernible link to the picture themselves. How come? "Every prospect," he told me, "would ask: What is it called? So I made them up off the top of my head." Moral: if you want your name included with the famous names in painting history, from Piet Mondriaan (whose painting just went for more than \$2 million) to Eisenhower and Winston Churchill, be sure to give it a title. Whether it be sunlight dancing on white skin or your Atari screen, call it September Morn or Venus or Mars on the Half-Shell, but be sure to give it a title.

Here are some abstract Forth "paintings" entitled RECT and PJOY and RNDP (for random point) and COLORDEMO and DDUMP you can try on your fig-Forth JACG disk #20 or on your Valforth. They were all adapted from Ekkehard Floegel's valuable \$8 "Forth on the Atari: Learning by Using."

These sketches open the door to graphics in Forth. Once you see how they work, you can strike off on your own and make it up as you go along. Try them in different graphics modes or try different colors or combine them in any way you want.

Load up your JACG disk followed by HEX 30 LOAD and then swap in a blank formatted disk to store your programs. To clear the hearts from blank screen number 5, type 5 WIFE FLUSH (in Valforth all you need is 5 CLR). I translated Floegel to Valforth with few mishaps. On the Valforth to JACG fig-Forth translation, I discovered the WIFE command and that the JACG disk will default to HEX--which accounts for the number of DECIMAL commands at the outset of the programs.

The first program draws a rectangle. Big deal! However, it shows the right way to structure a Forth program, where the main program in the last line calls the preceding programs in order. The program runs much faster than interpreted BASIC. The commands follow the standard BASIC graphics commands, which may encourage you to start translating some simple BASIC graphics programs into Forth. Would it work with PLOT and DRAWTO instead of PLOT inside a LOOP?

The next program makes the paintbrush obsolete--it has been replaced by the ATARI joystick so that the paint sticks to the screen and not to your fingers. The word ?TERMINAL lets you exit via the yellow keys. If you wander off the screen, you may lock up and have to reboot both disks.

SCR # 5

```
0 ( floegel p 37 graphics )
1 DECIMAL
2 : START 7 GR. 2 0 0 SETCOLOR
3 1 COLOR ;
4 : R>L 79 9 DO I 10 PLOT
5 LOOP ;
6 : U>D 79 10 DO 78 I PLOT
```

```
7 LOOP ;
8 : L>R 8 78 DO I 78 PLOT
9 -1 +LOOP ;
10 : D>U 9 78 DO 9 I PLOT
11 -1 +LOOP ;
12 : RECT START R>L U>D L>R D>U ;
```

SCR # 6

```
0 ( floegel p 39 joystick )
1 O VARIABLE X 0 VARIABLE Y
2 : +X 1 X +! ; : -X -1 X +! ;
3 : +Y -1 Y +! ; : -Y 1 Y +! ;
4 : STICK ( n )
5 DUP 14 = IF +Y ELSE
6 DUP 13 = IF -Y ELSE
7 DUP 7 = IF +X ELSE
8 DUP 11 = IF -X ELSE
9 DUP 6 = IF +X +Y ELSE
10 DUP 5 = IF +X -Y ELSE
11 DUP 9 = IF -X -Y ELSE
12 DUP 10 = IF -X +Y THEN THEN
13 THEN THEN THEN THEN THEN THEN ;
14
15
16 ( floegel p 39 joystick 2 )
17 : START 2 0 0 SETCOLOR 7 GR.
18 1 COLOR 10 Y ! 10 X !
19 : NOT 1 XOR ;
20 : PL X @ Y @ PLOT ;
21 : NPL X @ Y @ PLOT ;
22 : ?STICK 632 C@ DUP 15 = NOT
23 IF STICK PL THEN DROP ;
24 : PJOY START PL BEGIN ?STICK
25 ?TERMINAL UNTIL 0 GR. ;
26
```

The third program is a rerun of the old BASIC program that uses a random number to plot points on the screen until the screen fills up. No big shakes! What is interesting is the fact mentioned by Floegel that the ATARI generates random numbers at location 53770. They may not be the best for a real-time nuclear reactor simulation but they find endless uses in many games as well as sound and graphics demos. That silly GUESS MY NUMBER game needs a random number generator.

The fourth program corroborates what John Anderson of CREATIVE COMPUTING told you at the June meeting: the ATARI 800 is a light-years-ahead and state-of-the-art graphics machine that has not been obsoleted even by the promised new ATARI models. The flashing screen and border displays show this. Think of the color registers 708 to 712 as electronic paint buckets and the CF command at the start of the program as continuously pouring paint from one bucket to the next.

You can explore this capability in detail (in BASIC) in the Nov. 82 BYTE article by David Fox and Michael Waite in an excerpt from their 1982 book COMPUTER ANIMATION PRIMER (an ATARI must). "Unbeknownst to many people, the Atari 400/800 contains color-mapping hardware (called color registers), and this feature alone gives it awesome capabilities when compared to its competitors." The animated BASIC waterfall in changing colors is worth the price of the magazine.

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FORTH

```

SCR # 7
0 ( floegel p 41 random )
1 DECIMAL 0 VARIABLE RND
2 53770 @ RND !
3 : RANDOM RND @ 31421 * 6972 +
4 DUP RND ! ;
5 : RND# RANDOM U* SWAF DROP ;
6 : RND# 7 GR. 2 0 0 SETCOLOR
7 1 COLOR BEGIN 159 RND# 79 RND#
8 PLOT ?TERMINAL UNTIL ;
9

```

```

SCR # 8
0 ( floegel color p 45 )
1 DECIMAL
2 : WAITING 0 DO LOOP ;
3 : CF 712 C@ 710 C@ 712 C!
4 709 C@ 710 C! 709 C! ;
5 : CCF 100 0 DO CF 100 WAITING
6 LOOP 0 GR. ;
7 : BG 254 0 DO I 712 C! 500
8 WAITING 2 +LOOP ;
9 : FG 254 0 DO I 710 C! 500
A WAITING 2 +LOOP ;
B
C
D
E
F

```

```

10 ( floegel color p 45 2 )
11 : DI 16 0 DO I 709 C! 100
12 WAITING LOOP ;
13 : AR 0 14 DO I 709 C! 100
14 WAITING -1 +LOOP ;
15 : CURS 85 ! 84 C! ;
16 : CLR 125 EMIT ;
17 : DIS CLR 10 5 CURS 222 710 C!
18 ." Please hit any key "
19 3000 WAITING DI KEY AR ;
2A : COLORDEMO 125 EMIT
2B ." This is start of the demo "
2C CCF BG FG DIS CR
2D ." End of the demo " ;
2E

```

The fifth and last program gives you Superman's X-ray vision to let you peer at the bits and bytes hiding in back behind the keyboard and then display any part of memory on demand. There is a real-time clock in there, beating at the rate of 3600 times a minute (also referred to as the TV frame counter) as you can easily verify by displaying locations 18, 19 and 20.

The late great Richard Buckminster (geodesic) Fuller observed that "every child is born a genius...and then becomes de-geniused very rapidly by unfavorable circumstances and by the frustration of all their extraordinary built-in capabilities." With our Forth and our Atari, it can never happen to us.

```

SCR # 9
0 ( floegel hex dump p 46 )
1 HEX
2 : LNE ( n ) DUP DUP 8 + SWAF DO
3 I C@ 3 .R LOOP ;
4 : NR CR CR 5 SPACES 8 0 DO I 3
5 .R LOOP CR ;
6 : DOT DROP 2E ;
7 : ATARI ( n-n ) DUP 20 < IF DOT
8 ELSE DUP 7D = IF DOT ELSE DUP 7E
9 = IF DOT ELSE DUP 90 = IF DOT
10 ELSE DUP 9C = IF DOT ELSE DUP FB
11 > IF DOT THEN THEN THEN THEN
12 THEN THEN ;
13
14
15
16 ( floegel hex dump p 47 )
17 : ASCII ( a-a ) DUP DUP
18 8 + SWAF DO I
19 C@ ATARI EMIT 2 SPACES LOOP ;
20 : HDUMP( ( n-n' ) CR DUP . SPACE
21 LNE CR 7 SPACES ASCII 8 + ;
22 : DDUMP ( an ) HEX 7D EMIT
23 ." This is a hex dump of memory"
24 NR 0 DO HDUMP
25 LOOP DROP DECIMAL ;
26 DECIMAL
27

```

Writing for the JACG Newsletter

The JACG Newsletter seeks hardware and software reviews, tutorial articles, programs and any other information of interest to Atari computer users. Material should be sent to the Editor (see back page of this Newsletter for address) and conform to one of the following formats:

- 1) LJK Letter Perfect files on disk,
- 2) Text Wizard files on disk, 3) 4-1/4 inch column, single-spaced, dark black ink, right justified, no printing on perforation and pica font (10 cpi) hard copy, 4) AtariWriter files on disk or tape, 5) Bank Street Writer files on disk, 5) BASIC REM statements on disk, and 6) BASIC REM statements on tape. Anything else will not be accepted, especially hand written or non-justified type written. Figures should be in black ink and camera ready. Programs should be submitted on disk accompanied by a listing. If the program does not work as indicated, it will be returned.

The above format options are numbered from 1 through 6. The lower the number of the option you choose in submitting items for the JACG Newsletter, the better the Editor will like you and the sooner the item will appear in the Newsletter. Be sure to put your name, telephone number and format on any tape or disk given to the Newsletter Editor.

The Editor reserves the right to make changes, accept or reject submitted material.

ATARI Programming Languages by Richard Rospond - JACG

Last month we looked at programming languages in general, and BASIC in particular. This month we will look at Assembler, and you will see how it differs from BASIC. I will undoubtedly miss several important points, but all I am attempting to do is give you a flavor for the differences in the various languages. For detailed information, I recommend the ATARI Assembler by Don and Kurt Inman.

ASSEMBLY LANGUAGE & ASSEMBLERS

Writing in machine language requires the programmer to write the source listing so that he can figure out the memory locations, how many of them are required for each instruction and how many memory locations are required for the data. To do this using binary numbers makes the program almost impossible to read, so symbols were invented to stand for the instructions. These symbols were called mnemonics, and each processor has a unique set of them. The process of using mnemonics and a particular syntax to write a program is called Assembly Language.

The program that translates the assembly language source code into the machine language object code is called the Assembler. A typical assembler is a two-pass program. The first pass figures the length of the instruction and updates the location pointer in the microprocessor. It will also construct a Symbol table putting each symbolic name in alphabetic order. By the end of the first pass, all the symbols should have been given a value, if not we have an unresolved reference, resulting in an error message.

On the second pass, the Assembler again reads the source statements and translates them into object code in machine language, filling in the memory reference addresses with values from operand field of the source, or with symbolic values from the Symbol table. If there are no errors, then the object code version is printed and the result is saved on disk.

The object code presents the machine code in a form that can be read by a Loader program and run on the computer. If this is confusing think of the code as being assembled in an editor, then compiled using a two pass process. This differs from ATARI BASIC which is interpreted immediately after each line is entered.

Some Assembler programs have the capability of creating and using a collection of routines called macros, and are called Macro Assemblers. These are defined as one or more valid statements that may be called up by using a single symbol within the assembly language

program.

The macro must previously be defined by the user within the body of the program. The macro call is the statement that names the macro as the statement operator and gives it the necessary arguments. Such a call will cause one or more machine instructions to be assembled and the binary code to be generated.

ATARI offers both an assembler cartridge and a Macro/editor version on disk.

Each assembly language instruction has its own mnemonic code which is an abbreviation of the operation to be performed.

For example:

Mnemonic

Code	Operand	Operation performed
LDA	#14	Load the accumulator
with the number 14		
LDA	\$1100	Load the addumulator
with		
		the value contined in
		memory location 1100
STA	\$1105	Store the value
contained in the		
		accumulator in memory
	locations 1105	

These mnemonic codes are much easier for a programmer to work with than the numeric codes of machine language.

The assembly language program has line numbers similar to BASIC, and the program is automatically placed into the correct sequence of memory locations by the assembler.

Through the use of labels (combination of words, letters and/or numbers), branches are made to labeled instructions, and no calculations are required. The assembler does it for you.

The assembler creates the machine language program for you from the mnemonic codes, eliminating all the time consuming detail work. The chance for programmin errors is much less than for programs constructed by hand in machine language.

Space does not permit me to make a comparison of assembler versus machine language, which is very common, but take my word for it, assembler will give you the speed you require, and is much less tedious than machine code. Just one brief example:

Each instruction in MACHINELanguage has its own numeric code, which the programmer must memorize or look up each time he uses it.

Continued on 14

Examples:

Hex code Operation performed

A9 Load the accumulator with the number following the hex code

AD Load the accumulator with the number contained in the memory location that follows the hex code

8D Store the value in the accumulator into the memory location that follows the hex code.

This should appear more difficult than the examples given for assembly language.

The ATARI Assembler cartridge contains three separate programs:

1. The WRITER/EDITOR- is used to write and edit your assembly language program. Assembly language uses English like abbreviations to represent instructions to the computer. It also uses numbers in decimal or hexadecimal form to provide data for the programs.

2. The ASSEMBLER program translates the abbreviations provided by the Writer/Editor into machine language codes that the computer can understand. It also assigns the instructions and data to their proper memory locations.

3. The DEBUGGER program is used to execute, test, or trace the operations of the machine language program that the ASSEMBLER produced.

FORMAT- The program assembled is called a SOURCE program, which consists of statements just like BASIC. These statements are numbered like BASIC from 0-65535, and the program follows the sequence from the lowest to the highest number. The Assembler provides a machine language OBJECT PROGRAM from the SOURCE PROGRAM that we have written.

The 6502 microprocessor used in the ATARI has several special purpose registers. These registers hold 1 byte of data just like memory locations, but are used for special purposes.

1. The ACCUMULATOR- Most operations on data are performed here.
2. The X register is used as a scratch pad or as an index in certain addressing modes.
3. The Y register is used the same way as the X register.
4. The processor Status register contains a record of the micropocessor's status as each instruction is executed. Each bit of this register holds one item of status information.
5. The Stack Pointer Register is the memory locations of the top of the stack. The stack is a special block of memory at address 01FF down through 0100(hex).

Conclusions:

- If you think that BASIC is very complex, you will not have much luck with assembler.
- but if you require speed of execution, it can not be beat
- unless you have the time to write in machine code, which is extremely difficult

See this month's Technical Corner for a description of the BASIC USR function. This allows you to run assembler routines within a BASIC program- the best of both worlds.

** Next month- Pascal.

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binary numbers. An ON state is indicated by a 1 and an OFF is indicated by a 0. The value of the number is determined by adding all of the values of the positions containing a '1' together.

For example:

```
00000001= 1  
00000010= 2  
00000011= 3= 2+1  
00000101= 5= 4+1  
00001111= 15= 8+4+2+1  
01000000= 128  
11111111= 255= 128+64+43+16+8+4+2+1
```

Since the 6502B is an eight bit processor, each byte can hold a maximum value of 255 (11111111 in binary). This is not adequate for large numbers, so ATARI set aside two locations D4 and D5 (Hex) 212,213 (decimal). The ATARI will take the value stored in the highest location (D5/213) and multiply that by a value of 256, then add the value contained in the lower locations (D4/212) to the result. This allows for a maximum value of $(256 \times 255) + 255 = 65535$. We now are able to pass back a value from 0 - 65535 inclusive. This provides the user a much greater range of possible return code.

The same principle is used in the passing of input variables or values as well as in the addressing scheme of the ATARI itself. By the way- did you ever wonder why the ATARI can only address 64K? This is why: Divide 65536/1024 (1024 bytes = 1K). You get 64! Since the ATARI uses two bytes to determine the displacement into core of an address, it can only access a maximum of 65536 bytes (one extra for a displacement of zero).

Let's review what we have covered so far:

- BASIC programs have the facility to call assembler programs via the USR statement

- Programs may pass values to the assembler program and also return one value from the assembler code to the BASIC program.

- Values passed and returned from and to the BASIC code must be numeric integers and within the inclusive range of 0-65535.

- Values are passed to the assembler code via the 6502's stack and return code is passed back to BASIC via the fixed locations D4, D5 (HEX) or 212, 213 (decimal).

Some of you may say "Ernie, why are you tormenting me with these binary, hexadecimal and decimal tidbits? What value is it to me the novice programmer? The answer is simple. BASIC is great and easy to use, but it cannot allow all of the things that assembler can. In upcoming articles I will present the things that assembler can do. In future articles I will present some very helpful

assembler routines for your use and amazement. They will allow you to do things never before available without assembler, like reading/ writing sectors on disk. This initiation of sorts is necessary so that you will understand the things to come. Are you still confused? Don't worry. It will all fall into place over the next few months.

Those of you with little or no exposure to assembler will discover that it is really pretty easy to use. The only thing you must overcome is the anxiety of using it. Still worried? I will also provide data statements for all assembler code provided so that it will be simple to add these routines to any program you wish.

I think that is enough for this month. Remember- any suggestions, questions or problems relating to the ATARI and/or these articles should be directed to:

Ernest H. Rice III/ EHR 3
174 Summit Avenue, Summit, NJ 07901
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Editors note: Look in the Sept. issue of Creative Computing (Outpost ATARI) for reviews of Ernie's product line.

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TIDBITS

News and Views By
Arthur Leyenberger - JACG

RANA, RANA, once again. The latest news (rumor) on the ever-popular RANA disk drive is that it won't be shipped until Feb. 84. That was not a typo, NEXT YEAR. Jeez, that is truly awesome. What can I say? Maybe if they get their bugs out, it will come out sooner. Is it true that RANA purchased a railroad carload of RAID?

Atari 1050

Thanks to Bob at Gemini Electronics in Cedar Knolls, I was able to use an Atari 1050 disk drive for an evening and take a peek inside. Under the hood lurks a Tandon drive in a repackaged layout.

There is no mention on the box or in the documentation about DOS 3 or dual density. Supposedly, the drives are "DUAL DENSITY READY" and await only the software to give them the increased capacity. The only clue to this is that each time a disk is inserted into the drive after the initial power up, the drive whirrs as if it is checking for the density of the disk.

How'd it work Art? Well, it worked fine. It is a little quieter than the 810 but there is a slight rasping noise that may be specific to the unit I tested. By the way, the serial number on the drive I used was #279. In addition to being smaller, the drive is also lighter than the 810. It uses the same power supply as all of the Atari products.

Interestingly, Bob received only two units and both showed signs of the packaging having been sealed and then opened again. Meaning, the drives were packaged and ready to go and then for some reason, they were unpacked, something was done, and then they were re-packaged. Time will tell if the drives are as reliable as the 810s have become.

SCOPY 810

As most of you are aware, JACG, under license from Alliance Software, sells SCOPY 810 to members. Scopy is a sector copying program that allows a full disk to be copied in 2 passes. It is an excellent program and for \$6.00, a real bargain that all Atari disk users should have.

One particular application I do is to copy the printer driver file in LJK Letter Perfect using Scopy. If you wanted to put a printer driver on each of your disks, you would have to cycle through LJK's Printer Driver program for each disk. Instead, I run the driver program once, which puts the driver on a new disk. Then, I use Scopy to make multiple copies of the disk containing the driver. Since I do a lot of writing, this has made my life much easier. Scopy is also useful for making back ups of entire text file disks. It will read Atari or LJK disk format.

Atariwriter Printer Drivers

The APX Atariwriter printer drivers are now out. For \$17.00 you get a DOS disk containing a half dozen drivers for many printers. You use DOS to copy the driver for your particular printer onto your Atariwriter text disks as AUTORUN.SYS. Then, when you boot up the Atariwriter cartridge with your disk inserted in the drive, the driver loads and you are all set.

On my Epson FX-80 printer, I am now able to do proportional printing and use the Atariwriter built-in commands. You are now reading an example of proportional and double column printing.

FANTASTIC!

Proportional printing can also be done on a C. Itoh Prowriter.

Atariwriter and the drivers make this the best word processor for the Atari computer. See my review of the Atariwriter in the October issue of Creative Computing Magazine.

Getting Down to **BASIC**s

by Dick Kushner-JACG

Welcome to the first of a series of columns on the Atari BASIC language. I have just completed writing a book on this subject and, with a lot of information fresh in my mind, want to pass it along to you. The book should be out around December from Hayden Publishing Company. I am co-authoring the book with Jim Coan, who wrote Basic BASIC, Basic Apple BASIC and several other books. The book is far more than a rework of a book originally written for another computer (there are too many of those out there already). It goes from a very elementary introduction to BASIC statements through modifying display lists, covering a lot of ground in between.

The format of this column will probably vary over the months, dictated by the topics to be covered and the success of previous columns. For starters, I'll try a two-pronged format, with a section for beginners and a section for those who have some exposure to Atari BASIC. I'll call the two sections "You bought an Atari, huh? Now what?" and "There's more to BASIC than the basics".

Before we get started, let me state that this column can be as flexible as you want. Just let me know what you want covered and I'll find a way to work it into the presentation.

YOU BOUGHT AN ATARI, HUH? NOW WHAT?

The very best place to start is with the PRINT statement. Type in the following lines (pressing the <RETURN> key at the end of each line)

```
100 PRINT "THIS IS BEING TYPED"  
110 PRINT "ON THE ATARI HOME"  
120 PRINT "COMPUTER."
```

and then type RUN and press the <RETURN> key. You will be greeted with
THIS IS BEING TYPED
ON THE ATARI HOME
COMPUTER.

READY

with a white block beneath the R in READY. Believe it or not, you have just covered a tremendous amount of ground in this very simple program. First of all, the lines preceded by numbers comprise a real computer program. All lines that are preceded by numbers are interpreted by your computer to be part of a program. This means that they are stored in the computer's memory and the instructions in those lines will only be carried out when you type RETURN. This is referred to as the deferred mode of execution. If you type in a line without a line number, the instructions in that line will be carried out immediately upon pressing the <RETURN> key. This is called the immediate mode of execution. It can be very handy if you want to do calculator-type work, for example

PRINT 987.65*.05

will immediately give you the answer to the question, "at a 5% sales tax rate, what is the tax on \$987.65?". You could, of course, do the same thing in a program. The biggest advantage of using programs is that they can be used over and over again without having to type in all the program lines. As the months go by, we will learn how to make our programs able to handle a wide range of problems. Next month we'll discuss what other things we have learned from this first program.

THERE'S MORE TO BASIC THAN THE BASICS

Type the following two line program:

```
10 GRAPHICS 9  
20 GOTO 20
```

If your screen turns black, you have access to GRAPHICS 9, 10 and 11. If it stays blue, you don't, and ought to seriously consider having this chip installed in your Atari. These three modes provide for dazzling displays of many colors and subtle shadings.

All three modes use a cursor that is four times as wide as it is tall and display on a screen that is 80-by-192. This means that you can't do high resolution plotting with these modes, because the "points" that are plotted can't be smaller than the cursor size. However, the graphics capabilities of these modes make up for this lack of resolution.

First a brief look at what these modes are capable of displaying:

GRAPHICS 9: Here you can have any one color and 16 shades of that color on the screen at the same time. GRAPHICS 0-8 only allowed 8 shades. You can change the color whenever you want, but BASIC only permits one color on the screen at once. Very nice perspective effects are possible.

GRAPHICS 10: Nine colors with eight shades of each are possible at one time with this mode.

GRAPHICS 11: This is the inverse of GRAPHICS 9, permitting 16 colors with one shade. Dazzling multi-colored displays are easy to program.

Next month we'll begin to cover these three modes in detail, but for now we'll close with a short program to show off the colors of GRAPHICS 11.

```
90 REM * GRAPHICS 11 DOTS  
100 GRAPHICS 11:SETCOLOR 4,0,4  
105 COL=1:COLOR COL  
110 FOR I=1 TO 700  
120 X=INT(RND(0)*74+1)  
130 Y=INT(RND(0)*170+1)  
140 PLOT X,Y:DRAWTO X+5,Y+20  
150 COL=COL+1:IF COL=16 THEN COL=1  
160 COLOR COL  
170 NEXT I  
180 GOTO 180
```

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